



**CONESTOGA-ROVERS  
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May 18, 2012

Reference No. 038443-62

Ms. Karen Cibulskis  
Remedial Project Manager  
United States Environmental Protection Agency  
Region V  
77 West Jackson Boulevard  
Mail Code SR-6J  
Chicago, IL 60604

Dear Ms. Cibulskis:

Re: Explosive Gas Mitigation Work Plan (Work Plan) for  
Building 2, Parcel 5171, 1951 Dryden Road (B&G Trucking Building 2)  
Vapor Intrusion Investigation  
South Dayton Dump and Landfill Site (Site), Moraine, Ohio

This Work Plan details mitigation measures that will be completed to address volatile organic compound (VOC) concentrations detected in indoor air at the above building. Conestoga-Rovers & Associates (CRA) has prepared this Work Plan in accordance with the United States Environmental Protection Agency (USEPA) Vapor Intrusion Investigation Work Plan (USEPA, November 2011) and the USEPA Region 5 Vapor Intrusion Guidebook (USEPA, 2010) (USEPA Region 5 Guidance). CRA has also prepared this work plan to comply with the substantive requirements of Ohio Administrative Code (OAC) 3745-27-12 with respect to permanent monitoring for explosive gases in buildings located within the limits of waste. CRA has prepared this Work Plan on behalf of the Respondents to the Administrative Settlement Agreement and Order on Consent (ASAOC) with USEPA for Remedial Investigation/Feasibility Study (RI/FS) of the Site, Docket No. V-W-06-C-852 (Respondents).

As the B&G Trucking Building 2 requiring mitigation is situated on property that is owned and occupied by third parties, coordination of mitigation work with the owner and tenants is important, and any mitigation systems that are eventually installed will require their consent and the design of the mitigation system(s) will need to be consistent with on-going operations.

## **1.0 BACKGROUND**

Pursuant to the ASAOC with USEPA, the Respondents installed sub-slab (SS) soil vapor probes at the Site in December 2011, performed one round of monitoring (initial round) in January 2012, and one follow-up round of monitoring (Round 1 follow-up) in March 2012.



In January 2012, the Respondents collected sub-slab soil vapor samples to determine if compounds are present in soil vapor beneath on-Site and nearby building foundations, and floor slabs at concentrations sufficient to create the potential for contaminants to migrate into the indoor air of Site buildings at levels posing an unacceptable risk to building occupants. A summary of January 2012 B&G Building 2 sub-slab soil vapor analytical results, compared to the applicable screening levels, is presented in Table 1. The following table presents a summary of January 2012 B&G Building 2 sub-slab soil vapor VOC concentrations that were greater than Industrial Soil Vapor Screening Levels (SVSLs) for Further Investigation, corresponding to a target excess life-time cancer risk (ELCR) of  $10^{-6}$  or Hazard Index (HI) of 0.1 in indoor air, assuming a default attenuation factor (DAF) equal to 0.1:

<i><b>B&amp;G Trucking Building 2 SS Probe Location</b></i>	<i><b>Analyte</b></i>	<i><b>Concentration (<math>\mu\text{g}/\text{m}^3</math>)</b></i>	<i><b>Industrial SVSL for Further Investigation (DAF=0.1)</b></i>	
			<i><b>ELCR of <math>10^{-6}</math></b></i>	<i><b>HI = 0.1</b></i>
A	Chloroform	22 J / 21 J	5.3	430
	Trichloroethene	9,900 / 9,700	30	8.8
B	Ethylbenzene	98	49	4,400
	Xylenes (total)	520	NV	440

Notes:

9,900 / 9,700 - Result / Duplicate Result

$\mu\text{g}/\text{m}^3$  - microgram per cubic meter

J - Estimated quantity

NV - No Value

As sub-slab soil vapor VOC concentrations were greater than industrial SVSLs for further investigation, the Respondents collected follow-up samples of indoor air with concurrent sub-slab soil vapor samples. Follow-up sampling was completed to determine if indoor air VOC concentrations are greater than indoor air screening levels (IASLs) for mitigation, due to the VI pathway. The follow-up sub-slab soil vapor results were compared to USEPA SVSLs for Monitoring (i.e., for use with IASLs to determine if on-going monitoring is necessary). A summary of March 2012 B&G Building 2 sub-slab soil vapor analytical results, compared to the applicable screening levels, is presented in Table 2. The following table presents a summary of March 2012 B&G Trucking Building 2 sub-slab soil vapor VOC concentrations that were greater than Industrial SVSLs for Monitoring, corresponding to a target ELCR of  $10^{-5}$  or HI of 1 in indoor air, assuming a DAF equal to 0.1:



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<i>B&amp;G Trucking Building 2 SS Probe Location</i>	<i>Analyte</i>	<i>Concentration (<math>\mu\text{g}/\text{m}^3</math>)</i>	<i>Industrial SVSL for Monitoring (DAF=0.1)</i>	
			<i>ELCR of <math>10^{-5}</math></i>	<i>HI = 1</i>
A	Trichloroethene	16,000	300	88

Note:

$\mu\text{g}/\text{m}^3$  – microgram per cubic meter

Vapor attenuation refers to the reduction in concentration of volatile substances that occurs during vapor migration in the subsurface, coupled with the dilution that can occur when the vapors enter a building a mix with indoor air<sup>1</sup>. A vapor intrusion attenuation factor is the inverse measurement of the overall dilution that occurs as vapors migrate from a subsurface source into a building<sup>1</sup>. In March 2012, the Respondents collected collocated indoor air and sub-slab soil vapor samples for radon analysis from B&G Trucking Building 2. The Respondents completed radon sampling because i) Round 1 SS sample results contained VOCs at concentrations greater than applicable screening levels, and ii) B&G Trucking Building 2 has the potential for contamination of indoor air sample results due to chemical use in the building. Radon is a naturally formed radioactive gas, and is suitable for use as a line of evidence as the source of most radon is the ground beneath buildings. The Respondents calculated building attenuation factors between sub-slab soil vapor and indoor air using radon concentrations. The following table presents a summary of March 2012 B&G Trucking Building 2 radon concentrations, and associated attenuation factors:

<i>B&amp;G Trucking Building 2 Sample Location</i>	<i>Radon Concentration (pCi/L)</i>	<i>Attenuation Factor</i>	<i>Average Building Attenuation Factor</i>
IA_A	1	0.005	0.0035
A	202		
IA_B	0.67	0.002	
B	275		

Note:

pCi/L – picocuries per Liter

<sup>1</sup> USEPA. 2012. *EPA's Vapor Intrusion Database: Evaluation and Characterization of Attenuation Factors for Chlorinated Volatile Organic Compounds and Residential Buildings*. EPA/530-R-10-002. Office of Solid Waste and Emergency Response. Washington, D.C. March.



A summary of March 2012 B&G Trucking indoor air analytical results, compared to the applicable screening levels, is presented in Table 3. The following table presents a summary of March 2012 B&G Trucking Building 2 indoor air VOC concentrations that were greater than Industrial IASLs for Mitigation, corresponding to a target ELCR of  $10^{-5}$  or HI of 1 in indoor air:

<i>B&amp;G Trucking Building 2 Indoor Air Sample Location</i>	<i>Analyte</i>	<i>Concentration (<math>\mu\text{g}/\text{m}^3</math>)</i>	<i>Industrial IASL for Mitigation</i>	
			<i>ELCR of <math>10^{-5}</math></i>	<i>HI = 1</i>
IA_A	Ethylbenzene	1,200	49	4,400
	m&p-Xylenes	5,000	NV	440
	o-Xylene	1,700	NV	440
	Trichloroethene	69 J	30	8.8
IA_B	Ethylbenzene	410 J	49	4,400
	m&p-Xylenes	1,800	NV	440
	o-Xylene	670 J	NV	440
	Toluene	30,000	NV	22,000

Notes:

$\mu\text{g}/\text{m}^3$  – microgram per cubic meter

J – Estimated quantity

NV – No Value

The indoor air samples contained concentrations of ethylbenzene, m&p-xylenes, o-xylene, and toluene that were greater than applicable screening levels. These compounds were either not-detected in sub-slab soil vapor samples, were detected at concentrations less than applicable screening levels, or were detected at concentrations that did not correspond to the attenuation factors calculated from radon data. Sub-slab soil vapor chemical concentrations that were not detected, or present at concentrations less than applicable screening levels, were unlikely to result in detectable indoor air concentrations via the vapor intrusion pathway<sup>2</sup>. The presence of the same chemicals in indoor air at concentrations greater than applicable screening levels were likely due to indoor(background) sources. Additionally, the ratio of indoor air to sub-slab soil vapor chemical concentrations did not correspond to the attenuation factors calculated based on

<sup>2</sup> USEPA. 2012. *EPA's Vapor Intrusion Database: Evaluation and Characterization of Attenuation Factors for Chlorinated Volatile Organic Compounds and Residential Buildings*. EPA/530-R-10-002. Office of Solid Waste and Emergency Response. Washington, D.C. March.



radon data, which further confirms the likelihood of background source contributions to indoor air results.

Summaries of B&G Trucking Building 2 sub-slab soil vapor and indoor air vapor intrusion analytical results, compared to the applicable screening levels, are presented in Tables 1, 2, and 3. Figure 1 presents the sub-slab soil vapor and indoor air concentrations that were greater than applicable screening levels.

Chloroform was detected at a concentration greater than applicable criteria in a soil gas sample collected from exterior gas probe GP16-09 (located approximately 20 feet (ft) west of the building). Concentrations of ethylbenzene, toluene, xylenes, and trichloroethene were not detected, or detected at concentrations less than applicable criteria in samples collected from GP16-09 and vertical aquifer sampling location VAS-07 (located approximately 40 ft northwest of the building). The locations of the referenced investigative locations are presented on Figure 1.

As the TCE sub-slab soil vapor and indoor air results in samples collected from B&G Trucking Building 2 were greater than applicable criteria, this mitigation work plan discusses the mitigation system design and installation process, and identifies the monitoring, reporting, and schedule associated with the work.

## **2.0 BUILDING CONDITIONS**

In order to implement appropriate vapor intrusion engineering control measures, the building structure, including use, type of foundation, and type of heating/cooling/ventilation systems, must be understood.

The floor slab of a building can act as a barrier or avenue to VI. A slab that is in poor condition (i.e. cracked; unsealed; un-caulked floor, wall, or expansion joints) and is constructed of permeable material will permit more VI. An effectively sealed or well constructed slab in good condition will inhibit upward flow of sub-slab vapors. The presence of a barrier such as a vapor barrier beneath the slab, or in the form of a floor coating will also inhibit VI.

Another factor affecting vapor intrusion is a forced air heating system that draws cold air from within a building to be heated and returned to the indoor environment. This type of heating system can cause a negative pressure within the occupied space when operating, causing sub-slab soil vapors to more readily enter the heated space. This is especially true if cold air returns are blocked or not adequately sized for the blower fan.



The tendency to over-insulate and effectively weatherproof a building can contribute to less ventilation of the indoor area, and lead to the accumulation of contaminants in the indoor air space.

Conversely, an indoor space that is not heated, has exterior walls that are not well sealed, has roof-top air exchange vents, or a number of large doors which are in use (such as a warehouse or older industrial space) leads to the continual exchange of indoor air with air from outside the building, which is effective in preventing vapors from accumulating within a building.

The building is a single-story commercial use building, constructed prior to 1968. The building footprint is 5,000 square feet (ft<sup>2</sup>). The building is concrete slab-on grade, with unsealed joints. There is one large floor drain. Cracks and staining are visible in areas.

The building is used for large truck repair, with an office and break room area on the southern side. There is a second story within the southern third of the building, over the office and break room area; the ceilings are 8 ft high. The shop area ceiling is 20 ft high.

A forced air natural gas furnace in the office area centrally heats the building. An overhead radiant heating system and floor fans are present in the shop area. The building is not insulated, and is not air tight. Exterior openings include vents, utility pipe penetrations, windows, personnel doors, and one large roll-up door. The roll-up door is kept open during work hours. The building is occupied weekdays from 7 a.m. to 5 p.m. by two adult workers.

The Respondents installed sub-slab soil vapor Probe A in the shop area of B&G Building 2, and Probe B in the office area. The SS probe locations are presented on Figure 1.

The Respondents completed a survey of potential indoor VOC sources in March 2012. The potential sources of VOCs in B&G Trucking Building 2 included: paints; lacquer; hardeners; thinner; degreasers; dry agents; and a parts washer. The VOC contents of these products include: ethylbenzene, xylenes, acetone, petroleum distillates, and n-butyl acetone. As discussed above, concentrations of ethylbenzene, xylenes, and toluene were detected in samples of indoor air at concentrations greater than in samples of sub-slab soil vapor from B&G Trucking Building 2, indicating the indoor air sample concentrations are due to chemical use within the building and not from vapor intrusion.

### **3.0 PLANNED MITIGATION MEASURES**

The suitability of mitigation techniques depends partly on the permeability of the soil and the construction details of the building. The building construction details are discussed above and the physical characteristics of the soil are discussed below. Based on the GP16-09 and VAS-07



investigative locations in the vicinity of the building, the underlying stratigraphy consists of fine, sand and silt fill, and below 12.5 feet below ground surface (ft bgs), native sand and gravel material. Native material consists of well-graded, medium- to coarse grained sand and gravel. Respondents encountered a 6.5 ft thick layer of dense, moist, silt till, little sand, little gravel, trace very fine sand. The Respondents encountered a red brick clay fragments at a depth of 4.7 ft bgs in GP16-09, and waste material at a depths of 5 and 10 ft bgs in VAS-07. Generally, the soil and waste material beneath the Site does not present a barrier to subsurface gas migration, with the exception of the till layer. Small areas of finer-grained material may present local barriers to gas migration.

The mitigation measures to be implemented are detailed below.

### **3.1 EXPLOSIVE GAS MONITORING SYSTEM**

The Respondents propose to install an explosive gas alarms within B&G Trucking Building 2, dependent upon the consent of the owner. The explosive gas alarm system will consist of explosive gas sensors within the building that are designed to be readable from the building exterior and will alarm should concentrations of explosive gases within the building exceed 25 percent of the LEL (1.25 percent methane by volume). The Respondents propose to install one sensor in the shop area in the north portion of the building, and one sensor in the break room area in the southern portion of the building. The Respondents propose to install Sierra Monitoring Corporation (Sierra) Smart Infrared IR Combustible Gas Sensor Modules, Model 5100-28-IT, or equivalent, for the explosive gas sensors. The explosive gas alarms will be checked and maintained at the frequency recommended by the manufacturer. The alarms and readouts will be positioned such that any alarm will be audible or visible to persons prior to their entry to the portion of the building where the alarm is located. An explosive gas alarm system meets the requirements of OAC 3745-27-12. As the building is located within the limits of waste, requirements of OAC 3745-27-12(E) with respect to additional monitoring of permanent monitors located between the waste and the building are not applicable. Respondents will notify USEPA, Ohio EPA, and the local health district of any exceedance of threshold limits, in accordance with the requirements of OAC 3745-27-12.

### **3.2 PROPOSED MITIGATION TECHNIQUES**

Vapor intrusion mitigation can be implemented from a single remedy or combination of remedies. The proposed mitigation steps for the building will be based on building controls and are discussed in further detail below. An iterative approach, up to and including sub-slab depressurization, if necessary, is proposed.





### **3.3 BUILDING CONTROLS**

Building control remedies may reduce or eliminate the potential for vapor intrusion in buildings by preventing vapors present in the sub-slab from entering the indoor air of the building or increasing the flow rate of uncontaminated outdoor air into the building.

Potential applicable mitigation measures (as per USEPA Region 5 Guidance and Ohio EPA Guidance), include:

- Increasing ventilation in the building
- Sealing cracks on concrete floors
- Sub-slab depressurization

In order to identify and seal all floor cracks and other vapor entry points through the slab, the Respondents will work with the building owner and tenant to have all contents removed, if possible. The Respondents will seal all cracks, if possible, in accordance with the following methods:

- All floor surfaces that are currently unsealed will be cleaned using a wet/dry vacuum prior to applying sealant. A wire brush may be used to loosen dirt or debris prior to vacuuming. Surfaces will be cleaned of all dirt, debris, oil and grease, and dried prior to sealing.
- Open cracks will be routed and sealed with hydraulic cement, or other VOC-free sealant.

Should the previously discussed mitigation measures not result in a reduction in indoor air contaminant concentrations to less than applicable criteria, the Respondents will design, install, maintain, and monitor a mitigation system. The mitigation system will consist of an active venting system designed to remove the vapors from the sub-slab environment before the vapors can enter the building. The mitigation system will reduce or eliminate the VI exposure pathway, thereby reducing or eliminating potential future exposures associated with this pathway.

Active venting is fairly easily implemented and is a technology that can readily be implemented in existing buildings. Active venting, such as sub-slab depressurization, uses a fan to continually draw air from the sub-slab and to exhaust the explosive gases to the atmosphere where they do not represent a threat.

The proposed scope of work for a sub-slab depressurization system (SSDS) will include:

- i) Perform Communication Testing





- ii) Design SSDS
- iii) Install SSDS
- iv) Perform Maintenance and Monitoring

### **3.3.1 TASK 1 - PERFORM COMMUNICATION TESTING**

A design engineer will complete communication testing (also commonly called diagnostic testing) to evaluate the effectiveness of an SSDS prior to installation. This test will measure the radius of a suction field and assess the ability of air flow to extend through the sub-slab material. In the communication test, a centrally located hole is drilled through the concrete slab and suction is applied to this point using a high-flow/low-vacuum blower or fan capable of a sustainable flow rate of 100 to 1,000 liters per minute (L/min) against a vacuum of 5 to 50 inches of water column (developed using a high vacuum radon fan or Shop-Vac®-type vacuum). The design engineer will drill observations points (to supplement existing points) at various locations throughout the floor slab. Pressure changes in the sub-slab will be measured at the observation points, using a digital manometer or other similar device. Non-sparking equipment will be used to drill all locations required for communication testing. Combustible gas levels will be constantly monitored during all drilling activities.

A smoke test can also be performed at this time to confirm pressure measurements and to locate additional openings in the slab (cracks, joints, gaps, drain holes, etc.) that were not identified during the visual inspection and crack sealing discussed above. An inert, non-toxic, artificially created smoke unit will be used for leak detection, in order to avoid explosion hazards. Multiple suction points will be necessary for the testing of the B&G Trucking building, due to the size and complexity of the building. Following the tests, the test openings will be sealed to prevent VI, and to increase the effectiveness of the SSDS.

### **3.3.2 TASK 2 - DESIGN SUB-SLAB DEPRESSURIZATION SYSTEM**

The information obtained from the Building Physical Survey, sub-slab probe installation, and communication testing will be used to prepare conceptual layout design drawings. The system design will include the number and location of suction points, pipe routing, discharge point(s), fan location(s), and fan sizing. The Respondents will consult with the property owner and tenant for input on their preferences for system component locations. The design drawings will be prepared to a level acceptable for use for contractor bidding purposes. The design will be based on industry standards and manufacturer information regarding equipment performance for an active depressurization system.



Following completion of design, a Mitigation System Design Report will be submitted for USEPA approval. This design report will contain the following information:

- Data from the vacuum-radius of influence testing, including sub-slab vacuum and flow measurements
- Figure(s) showing the number of proposed extraction locations and performance monitoring points
- Figure(s) showing the planned route for the discharge piping system(s) and the location of the exhaust fan(s) for each building
- Identification of materials and equipment to be used for each system (piping, blower sizing, vacuum monitoring, valving, etc.)
- Procedures for startup and performance testing following system installation
- Proposed operational goals and objectives including radius of influence and vacuum field monitoring point vacuums

A visual inspection will be completed to verify that no air intakes have been located near the proposed exhaust discharge point(s).

Following receipt of approvals from the property owner, tenant, and USEPA on the mitigation system design, contractor proposals will be solicited and contractor procurement undertaken.

### **3.3.3 TASK 3 – INSTALL THE SSDS**

Any permitting requirements identified as part of the design phase and any required permits will be applied for and obtained prior to installation of startup of the SSDS consistent with state and local requirements. Any electrical installation; roof, floor, and wall penetrations; epoxy coatings; and horizontal piping will be installed by licensed, bonded, and insured installers. The system installation will be completed by a State of Ohio Department of Health-licensed and insured Radon Mitigation Contractor/Specialist who will perform all work in compliance with local code requirements. The contractor will install the SSDS following methods outlined in ASTM E212-11, "Standard Practice for Installing Radon Mitigation Systems in Existing Low-Rise Residential Buildings".

The exact design details will not be known until Tasks 1 and 2 have been completed, but a general discussion of the anticipated VI mitigation system is described below.

The SSDS may consist of multiple vapor recovery points. Either multiple fans or larger blowers connected to multiple extraction points will be installed outside the building. The fans or blowers will pull a vacuum from the vapor recovery points. The vapors will discharge to the



outdoor air above the building room. As methane is lighter than air, discharging the gases above the roof ensures that methane will not create a localized explosion hazard near the ground surface where potential ignition sources could ignite it. A sample port and an air-velocity monitoring access point will be installed in the discharge pipe at least two feet away from any constrictions (i.e., bends, elbows, etc.) and after (i.e., above) the fan. A common external fuse panel will be installed to power the SSDS system(s). The weatherproof panel will provide an uninterruptable power source, and be secured with a lock and tamper-proof box. Equipment used to install the SSDS will be intrinsically safe, because of the potential explosive situation.

Permanent vacuum monitoring points will be installed on each system, on the extraction side of the fan. A permanent vacuum gauge will consist of a "U-tube" manometer, or similar device, with a minimum vacuum of 1 inch of water. The permanent vacuum monitoring points will document that the sub-slab beneath the entire building has been depressurized. The Respondents will verify that manometer vacuum is in the range of 1 to 4 inches of water, and will mark the operating vacuum on the manometer.

An SSDS vacuum greater than 4 inches of water may result in suction of air from a contaminated plume and suction of VOCs towards the building.

Following the installation of the SSDS, the radius of influence will be checked using a digital manometer to determine if a vacuum is applied across the entire building slab. The digital manometer can be used at the sub-slab soil vapor probe locations, provided that they are located on opposite sides of the slab from the suction point. Additional sub-slab depressurization points and monitoring points can be installed if the resulting vacuum proves insufficient.

The following information will be recorded to define the operating performance of the SSDS:

- Location of the sub-slab sample points
- Initial sub-slab pressure field measurements
- Static pressure at each permanent vacuum monitoring point (U-tube manometer readings)
- Static pressure at the fan inlet

The Respondents will review the system components with the property owner and/or tenant following completion of system installation. If the property owner or tenant notices damage to the SSDS or the system is not functioning within the range marked on the permanent vacuum monitoring points, they will be able to call a CRA contact. Labels on the system components will list a telephone number for a CRA contact.



Any gaps around the extraction point penetration, utility penetrations, and other cracks in the foundation floor will be appropriately sealed.

### **3.3.4 TASK 4- PERFORM MAINTENANCE AND MONITORING**

#### **3.3.4.1 MAINTENANCE OF THE SSDS**

An operation, maintenance, and monitoring (OM&M) plan will be completed within 1 month of system start-up. The OM&M plan will detail activities required to operate the SSDS, perform repairs, and a guideline to evaluate the effectiveness of system operations.

The SSDS maintenance program consists of an inspection and repair program for the system components. The Respondents will conduct a semi-annual inspection of the SSDS in the first year of operation, and annually thereafter, to ensure proper functionality. The inspection program will include visual inspections of the SSDS for deficiencies to verify that the system components are effectively performing their intended functions. The following forms will be included in the OM&M Plan:

- Inspection checklist
- Inspection Log
- Repair Log

#### **3.3.4.2 MONITORING PROGRAM**

A system start-up monitoring program will be conducted to document that the sub-slab beneath the entire area of concern has been depressurized. The system start-up monitoring program was detailed in Section 3.3.1 above, and consists of measuring digital manometer readings at suitable sub-slab soil vapor probe locations. Monitoring will also include measurement of vacuum in the permanent vacuum monitoring points, and discharge flows, as well as operation and maintenance checks of the system components. The Respondents will complete monitoring at least twice during the first 24 hours, weekly for the first month, and monthly for the first quarter following system start-up monitoring. Periodic monitoring will continue on an annual basis, for the duration of the mitigation system operation. Monitoring results will be documented on a form or in a field log book.

#### **Post-installation proficiency sampling**

To verify that the SSDS is operating to reduce indoor air concentrations of VI contaminants to less than applicable criteria, the Respondents will complete post-installation proficiency



sampling consisting of the collection of indoor air samples from a location next to SS Probe A. Indoor air samples will be collected, analyzed, and evaluated in accordance with the USEPA-modified Vapor Intrusion Investigation Work Plan (November 2011). Respondents will collect indoor air samples approximately 30 days and 365 days after system installation to document that TCE concentrations in indoor air are decreasing, with the ultimate goal of reducing the concentrations to less than USEPA Industrial IASLs for Mitigation, corresponding to a target ELCR of  $10^{-5}$  or HI of 1 in indoor air. Indoor air sampling will be completed at a frequency of every five years from the SSDS system installation, provided the SSDS is still operational. The Respondents will provide the results and corresponding evaluation after each sampling event to USEPA within 30 days of receiving the complete set of preliminary analytical data.

If the indoor air sampling results are not below applicable IASLs, the Respondents will evaluate the performance of the SSDS and complete any necessary system modifications within 60 days of receiving validated analytical results. Following completion of system modifications, a follow-up indoor air sampling event will be completed within 30 days.

Quality Assurance/Quality Control (QA/QC) samples will be collected at the frequency specified in the USEPA-modified Vapor Intrusion Investigation Work Plan.

Property owners and tenants will be provided with a letter summarizing analytical data.

As detailed above, the Respondents will install two continuous explosive gas monitors within the building to document explosive gas concentrations in the indoor air, dependent upon the consent of the owner.

Should indoor air or sub-slab explosive gas concentrations increase to levels that exceed the relevant thresholds, additional mitigation measures will be evaluated for B&G Trucking Building 2.

#### **4.0 IMPLEMENTATION SCHEDULE**

The following schedule is anticipated for this project:

	<i>Estimated Completion Date</i>
Task 1 – Pre-Design Communication Testing	4 weeks from approval
Task 2 – SSDS Design	8 weeks from approval
Task 3 – SSDS Installation	12 weeks from approval



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The remedial alternatives for the Site as a whole, are discussed in the draft Streamlined Remedial Investigation and Feasibility Study Report for Operable Unit One (CRA, 2011) (OU1 RI/FS) and include the installation of a landfill cap over the entirety of OU1 with a passive landfill gas ventilation system. The OU1 RI/FS Report is currently under revision by USEPA. Section 2.4.2.2 of the draft OU1 RI/FS Report contains conceptual details for a passive LFG venting system. The details of the landfill gas mitigation system will be determined during the Remedial Design/Remedial Action (RD/RA) phase, based on a pre-design investigation. Any remedial alternative will include monitoring of the LFG mitigation system in accordance with the requirements of OAC 3745-27-12.

If you have any questions about the sampling results or the remedial activities underway at the Site, please contact me.

Yours truly,

CONESTOGA-ROVERS & ASSOCIATES

Adam Loney, B.Sc. Eng.

VC/cb/131  
Encl.

cc: Ken Brown, ITW  
Jim Campbell, Engineering Management, Inc.  
Bryan Heath, NCR  
Paul Jack, Castle Bay Inc.







TABLE 1

SUMMARY OF VAPOR INTRUSION ANALYTICAL RESULTS  
 ROUND 1: JANUARY 2012  
 PARCEL 5171 BUILDING 2 - B+G TRUCKING  
 SOUTH DAYTON DUMP AND LANDFILL SITE  
 MORaine, OHIO

Sample Location:	Parcel 5171, Bldg 2, Probe A		Parcel 5171, Bldg 2, Probe A	Parcel 5171, Bldg 2, Probe B
Sample ID:	SS-38443-011112-JC-061		SS-38443-011112-JC-062	SS-38443-011112-JC-063
Sample Date:	1/11/2012		1/11/2012	1/11/2012
	USEPA Industrial SVSL for Further Investigation	USEPA Industrial SVSL for Further Investigation	Duplicate	
Parameter	Corresponding to a Target ELCR of 10 <sup>-6</sup> in Indoor Air Assuming a DAF=0.1	Corresponding to a Target HI of 0.1 in Indoor Air Assuming a DAF=0.1		
	g	h		
Volatile Organic Compounds				
1,1,1-Trichloroethane	-	22000	64 J	14 U
1,1,2,2-Tetrachloroethane	2.1	-	27 U	21 U
1,1,2-Trichloroethane	7.7	0.88	10 U	7.8 U
1,1-Dichloroethane	77	-	14 U	11 U
1,1-Dichloroethene	-	880	12 U	8.9 U
1,2,4-Trichlorobenzene	-	8.8	37 U	28 U
1,2,4-Trimethylbenzene	-	-	25 U	87
1,2-Dibromoethane (Ethylene dibromide)	0.20	39	14 U	10 U
1,2-Dichlorobenzene	-	880	29 U	22 U
1,2-Dichloroethane	4.7	31	12 U	9.4 U
1,2-Dichloroethene (total)	-	-	5.5 U	4.2 U
1,2-Dichloropropane	12	18	6.4 U	4.9 U
1,2-Dichlorotetrafluoroethane (CFC 114)	-	-	22 U	17 U
1,3,5-Trimethylbenzene	-	-	25 U	27 J
1,3-Butadiene	-	-	2.2 U	1.7 U
1,3-Dichlorobenzene	11	3500	26 U	20 U
1,4-Dichlorobenzene	11	3500	26 U	20 U
1,4-Dioxane	-	-	32 U	24 U
2,2,4-Trimethylpentane	-	-	17 U	250
2-Butanone (Methyl ethyl ketone) (MEK)	-	22000	5.0 U	190
2-Chlorotoluene	-	-	24 U	18 U
2-Hexanone	-	130	16 U	12 U
2-Phenylbutane (sec-Butylbenzene)	-	-	26 U	19 U
4-Ethyl toluene	-	-	23 U	32 J
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	13000	11 U	29 J
Acetone	-	140000	24 J	4500
Allyl chloride	-	-	5.9 U	4.5 U
Benzene	16	130	5.7 U	4.3 U
Benzyl chloride	-	-	24 UJ	18 UJ
Bromodichloromethane	3.3	-	19 U	14 U
Bromoform	110	-	20 U	15 U
Bromomethane (Methyl bromide)	-	22	4.6 U	3.5 U
Butane	-	-	2.6 U	1400
Carbon disulfide	-	3100	20 U	15 U
Carbon tetrachloride	20	440	21 U	16 U
Chlorobenzene	-	220	9.1 U	6.9 U
Chlorodifluoromethane	-	-	12 U	9.0 U
Chloroethane	-	44000	4.2 U	3.2 U

TABLE 1

SUMMARY OF VAPOR INTRUSION ANALYTICAL RESULTS  
 ROUND 1: JANUARY 2012  
 PARCEL 5171 BUILDING 2 - B+G TRUCKING  
 SOUTH DAYTON DUMP AND LANDFILL SITE  
 MORaine, OHIO

Sample Location:	Parcel 5171, Bldg 2, Probe A		Parcel 5171, Bldg 2, Probe A	Parcel 5171, Bldg 2, Probe B
Sample ID:	SS-38443-011112-JC-061		SS-38443-011112-JC-062	SS-38443-011112-JC-063
Sample Date:	1/11/2012		1/11/2012	1/11/2012
	USEPA Industrial SVSL for Further Investigation	USEPA Industrial SVSL for Further Investigation	Duplicate	
Parameter	Corresponding to a Target ELCR of 10 <sup>-6</sup> in Indoor Air Assuming a DAF=0.1	Corresponding to a Target HI of 0.1 in Indoor Air Assuming a DAF=0.1		
	g	h		
Chloroform (Trichloromethane)	5.3	430	22 J <sup>g</sup>	11 U
Chloromethane (Methyl chloride)	-	390	2.7 U	2.0 U
cis-1,2-Dichloroethene	-	260	5.5 U	4.2 U
cis-1,3-Dichloropropene	31	88	7.2 U	5.5 U
Cyclohexane	-	26000	13 U	11 J
Cymene (p-Isopropyltoluene)	-	-	26 U	20 U
Dibromochloromethane	4.5	-	18 U	13 U
Dichlorodifluoromethane (CFC-12)	-	440	19 U	14 U
Ethylbenzene	49	4400	9.5 U	96 <sup>g</sup>
Hexachlorobutadiene	-	-	69 U	52 U
Hexane	-	-	9.1 U	6.9 U
Isopropyl alcohol	-	-	9.1 U	6.8 U
Isopropyl benzene	-	1800	15 U	11 U
m&p-Xylenes	-	440	21 U	400
Methyl methacrylate	-	-	5.3 U	4.0 U
Methyl tert butyl ether (MTBE)	470	13000	5.7 U	4.3 U
Methylene chloride	12000	2600	27 J	360
Naphthalene	3.6	13	45 UJ	34 UJ
N-Butylbenzene	-	-	30 U	23 U
N-Heptane	-	-	4.1 U	360
N-Propylbenzene	-	-	24 U	18 U
o-Xylene	-	440	9.5 U	120
Styrene	-	4400	13 U	51 J
tert-Butyl alcohol	-	-	21 U	16 U
tert-Butylbenzene	-	-	26 U	19 U
Tetrachloroethene	470	180	320 <sup>h</sup>	5.6 U
Tetrahydrofuran	-	-	5.3 U	4.0 U
Toluene	-	22000	35 J	6300
trans-1,2-Dichloroethene	-	260	13 U	9.5 U
trans-1,3-Dichloropropene	31	88	9.0 U	6.8 U
Trichloroethene	30	8.8	9900 <sup>gh</sup>	12 U
Trichlorofluoromethane (CFC-11)	-	3100	31 J	14 U
Trifluorotrichloroethane (Freon 113)	-	130000	7.6 U	5.8 U
Vinyl bromide (Bromoethene)	-	-	8.3 U	6.2 U
Vinyl chloride	28	440	7.4 U	5.6 U
Xylenes (total)	-	440	9.5 U	520 <sup>h</sup>

Gases

TABLE 1

SUMMARY OF VAPOR INTRUSION ANALYTICAL RESULTS  
 ROUND 1: JANUARY 2012  
 PARCEL 5171 BUILDING 2 - B+G TRUCKING  
 SOUTH DAYTON DUMP AND LANDFILL SITE  
 MORaine, OHIO

<i>Sample Location:</i>			<i>Parcel 5171, Bldg 2, Probe A</i>	<i>Parcel 5171, Bldg 2, Probe A</i>	<i>Parcel 5171, Bldg 2, Probe B</i>
<i>Sample ID:</i>			SS-38443-011112-JC-061	SS-38443-011112-JC-062	SS-38443-011112-JC-063
<i>Sample Date:</i>			1/11/2012	1/11/2012	1/11/2012
	<i>USEPA Industrial SVSL for Further Investigation</i>	<i>USEPA Industrial SVSL for Further Investigation</i>		<i>Duplicate</i>	
<i>Parameter</i>	<i>Corresponding to a Target ELCR of 10<sup>-6</sup> in Indoor Air Assuming a DAF=0.1</i>	<i>Corresponding to a Target HI of 0.1 in Indoor Air Assuming a DAF=0.1</i>			
	<i>g</i>	<i>h</i>			
Ethane (%)	-	-	-	-	-
Ethene (%)	-	-	-	-	-
Helium (%)	-	-	-	-	-
Methane (%)	0.5	0.5	-	-	-
<i>Radiology</i>					
Radon-222 (pCi/L)	-	-	-	-	-
<i>Field Parameters</i>					
Methane, field (%)	0.5	0.5	0.0	-	0.2

Notes:

All concentrations are expressed in units of micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) unless otherwise noted.  
 [1] - Landtec GEM 2000 measurement with/without charcoal carbon filter  
 J - Estimated.  
 R - Rejected  
 U - Non-detect at associated value.  
 UJ - Estimated reporting limit.  
 - - Not applicable.  
 pCi/L - picoCuries per liter  
 ppm - parts per million

TABLE 2

SUMMARY OF VAPOR INTRUSION ANALYTICAL RESULTS  
 ROUND 1 FOLLOW-UP: MARCH SUB-SLAB SOIL VAPOR  
 PARCEL 5171 BUILDING 2 - B+G TRUCKING  
 SOUTH DAYTON DUMP AND LANDFILL SITE  
 MORaine, OHIO

Sample Location:	Parcel 5171, Bldg 2, Probe A	Parcel 5171, Bldg 2, Probe A	Parcel 5171, Bldg 2, Probe B	Parcel 5171, Bldg 2, Probe B	Parcel 5171, Bldg 2, Probe B
Sample ID:	SS-38443-031412-JC-205	SS-38443-032712-JC-194	SS-38443-031412-JC-196	SS-38443-031412-JC-197	SS-38443-031412-JC-207
Sample Date:	3/14/2012	3/27/2012	3/14/2012	3/14/2012	3/14/2012
	USEPA Industrial SVSL for Monitoring	USEPA Industrial SVSL for Monitoring			
Parameter	Corresponding to a Target ELCR of $10^{-5}$ in Indoor Air Assuming a DAF=0.1	Corresponding to a Target HI of 1 in Indoor Air Assuming a DAF=0.1			
	i	j			
<b>Volatile Organic Compounds</b>					
1,1,1-Trichloroethane	-	220000	-	110 J	34 U
1,1,2,2-Tetrachloroethane	21	-	-	69 U	87 U
1,1,2-Trichloroethane	77	8.8	-	49 U	61 U
1,1-Dichloroethane	770	-	-	17 U	22 U
1,1-Dichloroethene	-	8800	-	21 U	26 U
1,2,4-Trichlorobenzene	-	88	-	120 U	150 U
1,2,4-Trimethylbenzene	-	-	-	51 U	110 J
1,2-Dibromoethane (Ethylene dibromide)	2.0	390	-	56 U	70 U
1,2-Dichlorobenzene	-	8800	-	69 U	88 U
1,2-Dichloroethane	47	310	-	31 U	40 U
1,2-Dichloroethene (total)	-	-	-	-	-
1,2-Dichloropropane	120	180	-	40 U	50 U
1,2-Dichlorotetrafluoroethane (CFC 114)	-	-	-	37 U	47 U
1,3,5-Trimethylbenzene	-	-	-	53 UJ	66 U
1,3-Butadiene	-	-	-	23 U	29 U
1,3-Dichlorobenzene	110	35000	-	64 U	81 U
1,4-Dichlorobenzene	110	35000	-	63 U	80 UJ
1,4-Dioxane	-	-	-	48 U	60 U
2,2,4-Trimethylpentane	-	-	-	30 U	96 J
2-Butanone (Methyl ethyl ketone) (MEK)	-	220000	-	97 U	190 J
2-Chlorotoluene	-	-	-	54 U	68 U
2-Hexanone	-	1300	-	39 U	49 U
2-Phenylbutane (sec-Butylbenzene)	-	-	-	58 U	73 U
4-Ethyl toluene	-	-	-	53 U	67 U
4-Methyl-2-pentanone (Methyl isobutyl ketone)	-	130000	-	30 U	170 J
Acetone	-	1400000	-	550 U	3200
Allyl chloride	-	-	-	25 U	31 U
Benzene	160	1300	-	29 U	37 U
Benzyl chloride	-	-	-	67 U	84 U
Bromodichloromethane	33	-	-	49 U	61 U
Bromoform	1100	-	-	82 U	100 U
Bromomethane (Methyl bromide)	-	220	-	20 U	26 U
Butane	-	-	-	25 U	640 J
Carbon disulfide	-	31000	-	16 U	20 U
Carbon tetrachloride	200	4400	-	39 UJ	50 U
Chlorobenzene	-	2200	-	37 U	47 U
Chlorodifluoromethane	-	-	-	22 U	62 J
Chloroethane	-	440000	-	15 U	19 U

TABLE 2

SUMMARY OF VAPOR INTRUSION ANALYTICAL RESULTS  
 ROUND 1 FOLLOW-UP: MARCH SUB-SLAB SOIL VAPOR  
 PARCEL 5171 BUILDING 2 - B+G TRUCKING  
 SOUTH DAYTON DUMP AND LANDFILL SITE  
 MORaine, OHIO

Sample Location:	Parcel 5171, Bldg 2, Probe A	Parcel 5171, Bldg 2, Probe A	Parcel 5171, Bldg 2, Probe B	Parcel 5171, Bldg 2, Probe B	Parcel 5171, Bldg 2, Probe B
Sample ID:	SS-38443-031412-JC-205	SS-38443-032712-JC-194	SS-38443-031412-JC-196	SS-38443-031412-JC-197	SS-38443-031412-JC-207
Sample Date:	3/14/2012	3/27/2012	3/14/2012	3/14/2012	3/14/2012
	USEPA Industrial SVSL for Monitoring	USEPA Industrial SVSL for Monitoring			
Parameter	Corresponding to a Target ELCR of 10 <sup>-5</sup> in Indoor Air Assuming a DAF=0.1	Corresponding to a Target HI of 1 in Indoor Air Assuming a DAF=0.1			
	i	j			
Chloroform (Trichloromethane)	53	4300	-	42 J	39 U
Chloromethane (Methyl chloride)	-	3900	-	54 U	69 U
cis-1,2-Dichloroethene	-	2600	-	39 U	49 U
cis-1,3-Dichloropropene	310	880	-	55 U	70 U
Cyclohexane	-	260000	-	23 U	29 U
Cymene (p-Isopropyltoluene)	-	-	-	52 U	65 U
Dibromochloromethane	45	-	-	59 U	74 U
Dichlorodifluoromethane (CFC-12)	-	4400	-	55 U	220
Ethylbenzene	490	44000	-	49 U	81 J
Hexachlorobutadiene	-	-	-	140 U	170 U
Hexane	-	-	-	19 U	23 U
Isopropyl alcohol	-	-	-	18 U	33 J
Isopropyl benzene	-	18000	-	49 U	61 U
m&p-Xylenes	-	4400	-	86 U	330
Methyl methacrylate	-	-	-	53 U	67 U
Methyl tert butyl ether (MTBE)	4700	130000	-	100 U	130 U
Methylene chloride	120000	26000	-	67 U	590
Naphthalene	36	130	-	78 U	98 U
N-Butylbenzene	-	-	-	42 UJ	53 U
N-Heptane	-	-	-	32 U	430
N-Propylbenzene	-	-	-	45 U	57 U
o-Xylene	-	4400	-	44 U	110 J
Styrene	-	44000	-	41 U	200
tert-Butyl alcohol	-	-	-	19 U	24 U
tert-Butylbenzene	-	-	-	60 U	75 U
Tetrachloroethene	4700	1800	-	540	56 U
Tetrahydrofuran	-	-	-	31 U	39 U
Toluene	-	220000	-	180	8500
trans-1,2-Dichloroethene	-	2600	-	33 U	41 U
trans-1,3-Dichloropropene	310	880	-	36 U	45 U
Trichloroethene	300	88	-	16000 <sup>U</sup>	40 U
Trichlorofluoromethane (CFC-11)	-	31000	-	42 J	28 U
Trifluorotrichloroethane (Freon 113)	-	1300000	-	39 U	49 U
Vinyl bromide (Bromoethene)	-	-	-	25 U	32 U
Vinyl chloride	280	4400	-	30 U	38 U
Xylenes (total)	-	4400	-	-	-

## Gases

TABLE 2

SUMMARY OF VAPOR INTRUSION ANALYTICAL RESULTS  
 ROUND 1 FOLLOW-UP: MARCH SUB-SLAB SOIL VAPOR  
 PARCEL 5171 BUILDING 2 - B+G TRUCKING  
 SOUTH DAYTON DUMP AND LANDFILL SITE  
 MORaine, OHIO

<i>Sample Location:</i>			<i>Parcel 5171, Bldg 2, Probe A</i>	<i>Parcel 5171, Bldg 2, Probe A</i>	<i>Parcel 5171, Bldg 2, Probe B</i>	<i>Parcel 5171, Bldg 2, Probe B</i>	<i>Parcel 5171, Bldg 2, Probe B</i>
<i>Sample ID:</i>			SS-38443-031412-JC-205	SS-38443-032712-JC-194	SS-38443-031412-JC-196	SS-38443-031412-JC-197	SS-38443-031412-JC-207
<i>Sample Date:</i>			3/14/2012	3/27/2012	3/14/2012	3/14/2012	3/14/2012
	USEPA Industrial SVSL for Monitoring	USEPA Industrial SVSL for Monitoring					
	Corresponding to a Target ELCR of $10^{-5}$ in Indoor Air Assuming a DAF=0.1	Corresponding to a Target HI of 1 in Indoor Air Assuming a DAF=0.1					
<i>Parameter</i>	<i>i</i>	<i>j</i>					
Ethane (%)	-	-	-	-	1.8 U	0.19 U	-
Ethene (%)	-	-	-	-	1.8 U	0.19 U	-
Helium (%)	-	-	-	-	-	-	-
Methane (%)	0.5	0.5	-	-	1.6 U	0.17 U	-
<i>Radiology</i>							
Radon-222 (pCi/L)	-	-	202 +/-10	-	-	-	275 +/-14
<i>Field Parameters</i>							
Methane, field (%)	0.5	0.5	-	0.0	0.1	0.1	-

Notes:  
 All concentrations are expressed in units of  
 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) unless  
 otherwise noted.  
 [1] - Landtec GEM 2000 measurement with/without charcoal carbon filter  
 J - Estimated.  
 R - Rejected  
 U - Non-detect at associated value.  
 UJ - Estimated reporting limit.  
 - - Not applicable.  
 pCi/L - picoCuries per liter  
 ppm - parts per million

TABLE 3

**SUMMARY OF VAPOR INTRUSION ANALYTICAL RESULTS  
ROUND 1 FOLLOW-UP: MARCH INDOOR AIR  
PARCEL 5171 BUILDING 2 - B+G TRUCKING  
SOUTH DAYTON DUMP AND LANDFILL SITE  
MORaine, OHIO**

Sample Location:

Sample ID:

Sample Date:

Parcel 5171, Bldg 2  
OA-38443-031412-JC-192  
3/14/2012

Parcel 5171, Bldg 2, 40 SW Corner Tree  
OA-38443-032712-JC-222  
3/27/2012

Parcel 5171, Bldg 2, IA\_A  
IA-38443-032712-JC-193  
3/27/2012

Parameter	USEPA Industrial IASL for Mitigation  Corresponding to a Target ELCR of $10^{-5}$ in Indoor Air  c	USEPA Industrial IASL for Mitigation  Corresponding to a Target HI of 1 in Indoor Air  d	USEPA Industrial IASL for High Priority / Rapid Response  Corresponding to a Target ELCR of $10^{-4}$ in Indoor Air  e	USEPA Industrial IASL for High Priority / Rapid Response  Corresponding to a Target HI of 10 in Indoor Air  f			
<b>Volatile Organic Compounds</b>							
1,1,1-Trichloroethane	-	22000	-	220000	0.16 U	0.16 U	50 U
1,1,2,2-Tetrachloroethane	2.1	-	21	-	0.42 U	0.42 U	130 U
1,1,2-Trichloroethane	7.7	0.88	77	8.8	0.29 U	0.29 U	89 U
1,1-Dichloroethane	77	-	770	-	0.11 U	0.11 U	32 U
1,1-Dichloroethene	-	880	-	8800	0.13 U	0.13 U	38 U
1,2,4-Trichlorobenzene	-	8.8	-	88	0.73 U	0.73 U	220 U
1,2,4-Trimethylbenzene	-	-	-	-	0.51 J	0.31 U	100 J
1,2-Dibromoethane (Ethylene dibromide)	0.2	39	2	390	0.34 U	0.34 U	100 U
1,2-Dichlorobenzene	-	880	-	8800	0.67 J	0.42 U	130 U
1,2-Dichloroethane	4.7	31	47	310	0.19 U	0.19 U	58 U
1,2-Dichloroethene (total)	-	-	-	-	-	-	-
1,2-Dichloropropane	12	18	120	180	0.24 U	0.24 U	73 U
1,2-Dichlorotetrafluoroethane (CFC 114)	-	-	-	-	0.22 U	0.22 U	68 U
1,3,5-Trimethylbenzene	-	-	-	-	0.32 U	0.32 UJ	97 UJ
1,3-Butadiene	-	-	-	-	0.14 U	0.14 U	43 U
1,3-Dichlorobenzene	11	3500	110	35000	0.39 U	0.39 U	120 U
1,4-Dichlorobenzene	11	3500	110	35000	0.96 J	0.38 U	120 U
1,4-Dioxane	-	-	-	-	0.29 U	0.29 U	87 U
2,2,4-Trimethylpentane	-	-	-	-	0.56 J	0.18 U	55 U
2-Butanone (Methyl ethyl ketone) (MEK)	-	22000	-	220000	1.6 J	0.67 J	3700
2-Chlorotoluene	-	-	-	-	0.33 U	0.33 U	99 U
2-Hexanone	-	130	-	1300	0.24 U	0.24 U	72 U
2-Phenylbutane (sec-Butylbenzene)	-	-	-	-	0.35 U	0.35 U	110 U
4-Ethyl toluene	-	-	-	-	0.32 U	0.32 U	98 U
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	13000	-	130000	0.18 U	0.18 U	1200
Acetone	-	140000	-	1400000	8.9 J	3.3 U	5300
Allyl chloride	-	-	-	-	0.15 U	0.15 U	46 U
Benzene	16	130	160	1300	1.0	0.47 J	54 U
Benzyl chloride	-	-	-	-	0.40 U	0.40 U	120 U
Bromodichloromethane	3.3	-	33	-	0.29 U	0.29 U	89 U
Bromoform	110	-	1100	-	0.50 U	0.50 U	150 U
Bromomethane (Methyl bromide)	-	22	-	220	0.12 U	0.12 U	38 U
Butane	-	-	-	-	11 J	1.7	450
Carbon disulfide	-	3100	-	31000	0.097 U	0.097 U	29 U
Carbon tetrachloride	20	440	200	4400	0.46 J	0.53 J	72 UJ
Chlorobenzene	-	220	-	2200	2.5	0.23 U	68 U
Chlorodifluoromethane	-	-	-	-	2.9 J	0.86	87 J
Chloroethane	-	44000	-	440000	0.092 U	0.092 U	28 U



TABLE 3

SUMMARY OF VAPOR INTRUSION ANALYTICAL RESULTS  
 ROUND 1 FOLLOW-UP: MARCH INDOOR AIR  
 PARCEL 5171 BUILDING 2 - B+G TRUCKING  
 SOUTH DAYTON DUMP AND LANDFILL SITE  
 MORaine, OHIO

Sample Location:

Sample ID:

Sample Date:

Parcel 5171, Bldg 2  
 OA-38443-031412-JC-192  
 3/14/2012

Parcel 5171, Bldg 2, 40 SW Corner Tree  
 OA-38443-032712-JC-222  
 3/27/2012

Parcel 5171, Bldg 2, IA\_A  
 IA-38443-032712-JC-193  
 3/27/2012

Parameter	USEPA Industrial IASL for Mitigation  Corresponding to a Target ELCR of $10^{-5}$ in Indoor Air  <i>c</i>	USEPA Industrial IASL for Mitigation  Corresponding to a Target HI of 1 in Indoor Air  <i>d</i>	USEPA Industrial IASL for High Priority / Rapid Response  Corresponding to a Target ELCR of $10^{-4}$ in Indoor Air  <i>e</i>	USEPA Industrial IASL for High Priority / Rapid Response  Corresponding to a Target HI of 10 in Indoor Air  <i>f</i>			
Chloroform (Trichloromethane)	5.3	430	53	4300	0.82 J	0.19 U	56 U
Chloromethane (Methyl chloride)	-	390	-	3900	1.5	1.2	100 U
cis-1,2-Dichloroethene	-	260	-	2600	0.24 U	0.24 U	72 U
cis-1,3-Dichloropropene	31	88	310	880	0.34 U	0.34 U	100 U
Cyclohexane	-	26000	-	260000	0.14 U	0.14 U	48 J
Cymene (p-Isopropyltoluene)	-	-	-	-	0.31 U	0.31 U	95 U
Dibromochloromethane	4.5	-	45	-	0.36 U	0.36 U	110 U
Dichlorodifluoromethane (CFC-12)	-	440	-	4400	2.5	2.1	100 U
Ethylbenzene	49	4400	490	44000	0.61 J	0.30 U	1200 <sup>ee</sup>
Hexachlorobutadiene	-	-	-	-	0.83 U	0.83 U	250 U
Hexane	-	-	-	-	1.1 J	0.56 J	69 J
Isopropyl alcohol	-	-	-	-	2.9 J	0.42 J	79 J
Isopropyl benzene	-	1800	-	18000	0.29 U	0.29 U	89 U
m&p-Xylenes	-	440	-	4400	2.1	0.52 U	5000 <sup>df</sup>
Methyl methacrylate	-	-	-	-	0.32 U	0.32 U	98 U
Methyl tert butyl ether (MTBE)	470	13000	4700	130000	0.61 U	0.61 U	190 U
Methylene chloride	12000	2600	120000	26000	1.3 J	0.69 U	890
Naphthalene	3.6	13	36	130	0.47 U	0.47 U	140 U
N-Butylbenzene	-	-	-	-	0.25 U	0.25 UJ	77 UJ
N-Heptane	-	-	-	-	1.0 J	0.24 J	740
N-Propylbenzene	-	-	-	-	0.28 U	0.28 U	83 U
o-Xylene	-	440	-	4400	0.69 J	0.26 U	1700 <sup>d</sup>
Styrene	-	4400	-	44000	0.25 U	0.25 U	240 J
tert-Butyl alcohol	-	-	-	-	0.31 J	0.12 U	35 U
tert-Butylbenzene	-	-	-	-	0.36 U	0.36 U	110 U
Tetrachloroethene	470	180	4700	1800	1.6	0.27 U	82 U
Tetrahydrofuran	-	-	-	-	0.19 U	0.19 U	56 U
Toluene	-	22000	-	220000	6.4	1.2	22000
trans-1,2-Dichloroethene	-	260	-	2600	0.20 U	0.20 U	60 U
trans-1,3-Dichloropropene	31	88	310	880	0.22 U	0.22 U	66 U
Trichloroethene	30	8.8	300	88	2.7	0.22 J	69 <sup>cd</sup>
Trichlorofluoromethane (CFC-11)	-	3100	-	31000	1.6	1.0 J	41 U
Trifluorotrichloroethane (Freon 113)	-	130000	-	1300000	0.51 J	0.55 J	72 U
Vinyl bromide (Bromoethene)	-	-	-	-	0.15 U	0.15 U	46 U
Vinyl chloride	28	440	280	4400	0.18 U	0.18 U	55 U
Xylenes (total)	-	440	-	4400	-	-	-
<b>Gases</b>							
Ethane (%)	-	-	-	-	-	-	-

TABLE 3

**SUMMARY OF VAPOR INTRUSION ANALYTICAL RESULTS  
ROUND 1 FOLLOW-UP: MARCH INDOOR AIR  
PARCEL 5171 BUILDING 2 - B+G TRUCKING  
SOUTH DAYTON DUMP AND LANDFILL SITE  
MORaine, OHIO**

<i>Sample Location:</i>					<i>Parcel 5171, Bldg 2</i>	<i>Parcel 5171, Bldg 2, 40 SW Corner Tree</i>	<i>Parcel 5171, Bldg 2, IA_A</i>
<i>Sample ID:</i>					<i>OA-38443-031412-JC-192</i>	<i>OA-38443-032712-JC-222</i>	<i>IA-38443-032712-JC-193</i>
<i>Sample Date:</i>					<i>3/14/2012</i>	<i>3/27/2012</i>	<i>3/27/2012</i>
	<i>USEPA Industrial IASL for Mitigation</i>	<i>USEPA Industrial IASL for Mitigation</i>	<i>USEPA Industrial IASL for High Priority/ Rapid Response</i>	<i>USEPA Industrial IASL for High Priority/ Rapid Response</i>			
<i>Parameter</i>	<i>Corresponding to a Target ELCR of 10<sup>-5</sup> in Indoor Air</i>	<i>Corresponding to a Target HI of 1 in Indoor Air</i>	<i>Corresponding to a Target ELCR of 10<sup>-4</sup> in Indoor Air</i>	<i>Corresponding to a Target HI of 10 in Indoor Air</i>			
	<i>c</i>	<i>d</i>	<i>e</i>	<i>f</i>			
Ethene (%)	-	-	-	-	-	-	-
Helium (%)	-	-	-	-	-	-	-
Methane (%)	0.05	0.05	0.05	0.05	-	-	-
<i>Radiology</i>							
Radon-222 (pCi/L)	-	-	-	-	-	-	-
<i>Field Parameters</i>							
Methane, field (%)	0.05	0.05	0.05	0.05	0.0	0.0	0.0

## Notes:

All concentrations are expressed in units of micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) unless otherwise noted.

[1] - Landtec GEM 2000 measurement with/without charcoal carbon filter

J - Estimated.

R - Rejected

U - Non-detect at associated value.

UJ - Estimated reporting limit.

- - Not applicable.

pCi/L - picoCuries per liter

ppm - parts per million

TABLE 3

**SUMMARY OF VAPOR INTRUSION ANALYTICAL RESULTS  
ROUND 1 FOLLOW-UP: MARCH INDOOR AIR  
PARCEL 5171 BUILDING 2 - B+G TRUCKING  
SOUTH DAYTON DUMP AND LANDFILL SITE  
MORaine, OHIO**

<i>Sample Location:</i>	<i>Parcel 5171, Bldg 2, IA_B</i>		<i>Parcel 5171, Bldg 2, IA_A</i>	<i>Parcel 5171, Bldg 2, IA_B</i>
<i>Sample ID:</i>	<i>IA-38443-031412-JC-195</i>		<i>IA-38443-031412-JC-204</i>	<i>IA-38443-031412-JC-206</i>
<i>Sample Date:</i>	<i>3/14/2012</i>		<i>3/14/2012</i>	<i>3/14/2012</i>
	<i>USEPA Industrial IASL for Mitigation</i>	<i>USEPA Industrial IASL for Mitigation</i>		
<i>Parameter</i>	<i>Corresponding to a Target ELCR of 10<sup>-5</sup> in Indoor Air</i>	<i>Corresponding to a Target HI of 1 in Indoor Air</i>		
	<i>c</i>	<i>d</i>		
<b><i>Volatile Organic Compounds</i></b>				
1,1,1-Trichloroethane	-	22000	140 U	-
1,1,2,2-Tetrachloroethane	2.1	-	360 U	-
1,1,2-Trichloroethane	7.7	0.88	250 U	-
1,1-Dichloroethane	77	-	89 U	-
1,1-Dichloroethene	-	880	110 U	-
1,2,4-Trichlorobenzene	-	8.8	620 U	-
1,2,4-Trimethylbenzene	-	-	1400	-
1,2-Dibromoethane (Ethylene dibromide)	0.2	39	290 U	-
1,2-Dichlorobenzene	-	880	360 U	-
1,2-Dichloroethane	4.7	31	160 U	-
1,2-Dichloroethene (total)	-	-	-	-
1,2-Dichloropropane	12	18	200 U	-
1,2-Dichlorotetrafluoroethane (CFC 114)	-	-	190 U	-
1,3,5-Trimethylbenzene	-	-	270 UJ	-
1,3-Butadiene	-	-	120 U	-
1,3-Dichlorobenzene	11	3500	330 U	-
1,4-Dichlorobenzene	11	3500	330 U	-
1,4-Dioxane	-	-	250 U	-
2,2,4-Trimethylpentane	-	-	150 U	-
2-Butanone (Methyl ethyl ketone) (MEK)	-	22000	1300 J	-
2-Chlorotoluene	-	-	280 U	-
2-Hexanone	-	130	200 U	-
2-Phenylbutane (sec-Butylbenzene)	-	-	300 U	-
4-Ethyl toluene	-	-	280 U	-
4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	-	13000	710 J	-
Acetone	-	140000	13000	-
Allyl chloride	-	-	130 U	-
Benzene	16	130	150 U	-
Benzyl chloride	-	-	340 U	-
Bromodichloromethane	3.3	-	250 U	-
Bromoform	110	-	420 U	-
Bromomethane (Methyl bromide)	-	22	110 U	-
Butane	-	-	150 J	-
Carbon disulfide	-	3100	82 U	-
Carbon tetrachloride	20	440	200 UJ	-
Chlorobenzene	-	220	190 U	-
Chlorodifluoromethane	-	-	110 U	-
Chloroethane	-	44000	78 U	-

TABLE 3

**SUMMARY OF VAPOR INTRUSION ANALYTICAL RESULTS  
ROUND 1 FOLLOW-UP: MARCH INDOOR AIR  
PARCEL 5171 BUILDING 2 - B+G TRUCKING  
SOUTH DAYTON DUMP AND LANDFILL SITE  
MORaine, OHIO**

<i>Sample Location:</i>	<i>Parcel 5171, Bldg 2, IA_B</i>		<i>Parcel 5171, Bldg 2, IA_A</i>	<i>Parcel 5171, Bldg 2, IA_B</i>
<i>Sample ID:</i>	<i>IA-38443-031412-JC-195</i>		<i>IA-38443-031412-JC-204</i>	<i>IA-38443-031412-JC-206</i>
<i>Sample Date:</i>	<i>3/14/2012</i>		<i>3/14/2012</i>	<i>3/14/2012</i>
	<i>USEPA Industrial IASL for Mitigation</i>	<i>USEPA Industrial IASL for Mitigation</i>		
<i>Parameter</i>	<i>Corresponding to a Target ELCR of 10<sup>-5</sup> in Indoor Air</i>	<i>Corresponding to a Target HI of 1 in Indoor Air</i>		
	<i>c</i>	<i>d</i>		
Chloroform (Trichloromethane)	5.3	430	160 U	-
Chloromethane (Methyl chloride)	-	390	280 U	-
cis-1,2-Dichloroethene	-	260	200 U	-
cis-1,3-Dichloropropene	31	88	290 U	-
Cyclohexane	-	26000	120 U	-
Cymene (p-Isopropyltoluene)	-	-	270 U	-
Dibromochloromethane	4.5	-	300 U	-
Dichlorodifluoromethane (CFC-12)	-	440	350 J	-
Ethylbenzene	49	4400	410 J <sup>c</sup>	-
Hexachlorobutadiene	-	-	710 U	-
Hexane	-	-	96 U	-
Isopropyl alcohol	-	-	150 J	-
Isopropyl benzene	-	1800	250 U	-
m&p-Xylenes	-	440	1800 <sup>d</sup>	-
Methyl methacrylate	-	-	270 U	-
Methyl tert butyl ether (MTBE)	470	13000	520 U	-
Methylene chloride	12000	2600	1500 U	-
Naphthalene	3.6	13	400 U	-
N-Butylbenzene	-	-	210 U	-
N-Heptane	-	-	1300 J	-
N-Propylbenzene	-	-	230 U	-
o-Xylene	-	440	670 J <sup>d</sup>	-
Styrene	-	4400	680 J	-
tert-Butyl alcohol	-	-	98 U	-
tert-Butylbenzene	-	-	310 U	-
Tetrachloroethene	470	180	230 U	-
Tetrahydrofuran	-	-	160 U	-
Toluene	-	22000	30000 <sup>d</sup>	-
trans-1,2-Dichloroethene	-	260	170 U	-
trans-1,3-Dichloropropene	31	88	190 U	-
Trichloroethene	30	8.8	160 U	-
Trichlorofluoromethane (CFC-11)	-	3100	110 U	-
Trifluorotrichloroethane (Freon 113)	-	130000	200 U	-
Vinyl bromide (Bromoethene)	-	-	130 U	-
Vinyl chloride	28	440	150 U	-
Xylenes (total)	-	440	-	-
<i>Gases</i>				
Ethane (%)	-	-	-	-

TABLE 3

**SUMMARY OF VAPOR INTRUSION ANALYTICAL RESULTS  
ROUND 1 FOLLOW-UP: MARCH INDOOR AIR  
PARCEL 5171 BUILDING 2 - B+G TRUCKING  
SOUTH DAYTON DUMP AND LANDFILL SITE  
MORaine, OHIO**

<i>Sample Location:</i>			<i>Parcel 5171, Bldg 2, IA_B</i>	<i>Parcel 5171, Bldg 2, IA_A</i>	<i>Parcel 5171, Bldg 2, IA_B</i>
<i>Sample ID:</i>			<i>IA-38443-031412-JC-195</i>	<i>IA-38443-031412-JC-204</i>	<i>IA-38443-031412-JC-206</i>
<i>Sample Date:</i>			<i>3/14/2012</i>	<i>3/14/2012</i>	<i>3/14/2012</i>
	<i>USEPA Industrial IASL for Mitigation</i>	<i>USEPA Industrial IASL for Mitigation</i>			
<i>Parameter</i>	<i>Corresponding to a Target ELCR of 10<sup>-5</sup> in Indoor Air</i>	<i>Corresponding to a Target HI of 1 in Indoor Air</i>			
	<i>c</i>	<i>d</i>			
Ethene (%)	-	-	-	-	-
Helium (%)	-	-	-	-	-
Methane (%)	0.05	0.05	-	-	-
<i>Radiology</i>					
Radon-222 (pCi/L)	-	-	-	1.00 +/-0.06	0.67 +/-0.07
<i>Field Parameters</i>					
Methane, field (%)	0.05	0.05	0.0	-	-

## Notes:

All concentrations are expressed in units of micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) unless otherwise noted.

[1] - Landtec GEM 2000 measurement with/without charcoal carbon filter

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